1. A camera is accidentally dropped from the edge of a cliff and 6.0 s later reaches the bottom

a. how fast was it going just before it hit?

**Vf = v i + at**

**0 + 9.8 m/s2 (6.0 s) = 59 m/s**

b. how high is the cliff?

**d = vi t + 1/2 at 2  
0(6.0) + 1/2 (9.8 m/s2) (6.0 s) 2**

**1.8 x 10 2 m**

2. a platform diver jumps vertically with a velocity of 4.2 m/s. 2.5 s later the diver enters the water. How high is the platform above the water?

**d = vi t + 1/2 a t2**

**= (4.2 m/s) (2.5 s) + 1/2 (-9.8 m/s 2) (2.5 s)2**

**= -20 m**

**Diver is 20 meters below starting point or platform is 20 m high**

3, Light from the sun reaches Earth in 8.3 minutes. The velocity of light is 3.00 X 10 8 m/s. How far is earth from the sun?

**time = 8.3 min = 498 = 5.0 x 10 2 s**

**v=d/t**

**3.00 X 10 8 m/s) (5.0 X 10 2 m/s**

**1.5 x 10 11 mm**

4. Ann is driving down a street in a car at 55 km/h. Suddenly a child runs into the street. If it takes Ann 0.75 s to react and apply the brakes, how many meters will she have moved before she begins to slow down?

**v=d/t**

**55 km/h) (1000 m/km)**

**(3600 s/h =11 m**

5. Bob walks 80 m and then he walks 125 m

a. What is Bob's displacement if he walks east both times? **205 m**

b. what is bob's displacement if he walks east then west? **-45 m**

c. what distance does Bob walk in each case? **205 m**

6. 0.30 s after seeing a puff of smoke rise from the starter's pistol, the sound of the firing of the pistol is heard by the track timer 100 m away. What is the velocity of sound?

**v=d/t 100/0.30 = 330 m/s**

7. a bullet is fired with a speed of 720.0 m/s

a. what time is required for the bullet to strike a target at a position of + 324 m?

**t=d/v = 324m/720.0 m/s = .450 s**

b. what is the velocity in km/h?

**v = 720 m/s) 3600 s/h)**

**1000 m/km = 2592 km/hr**

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b. what is the velocity in km/h?

Problem Worksheet for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ date \_\_\_\_\_\_\_

* **If you start from rest (dropped) the initial velocity is 0**
* **(I used 10 m/s2 instead of 9.8 m/s2 on some below)**
* ***To convert km/hr to m/s; divide # by 3.6***
* **To convert m/s to km/hr you multiply by 3.6**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Image** | **Given/ Want** | **Formula** | **Formula filled in** | **Answer w/unit** |
| 1 a | Dropped  If it is falling- use g (9.8 s2)  g = gravity  6 sec  hits | T = 6 sec  g = 9.8 m/s2  vi = 0  Vf= X =how fast ? | Vf = vi + at | Vf = 0 + (9.8 m/s2) (6 sec)  (motion in 1 direction only) | = 59 m/s |
| 1b | ABOVE  Need height = distance | T = 6 sec  g = 9.8 m/s2  vi = 0  Vf= 59 m/s  D = | D = vi t + ½ at2 | D= 0 (6sec)+1/2 ( 10m/s2 (6sec)  = 0 + 5 m/s2 (6sec) | 180 m  Or  1.8 X 102 m |
| 2 | Vi = 4.2 m/s (up)  Fall time 2.5 sec  Height?  Falling (down-) negative gravity | Vi = 4.2 m/s (up)  T = 2.5 sec  G = 10 m/s2  Height = D = ? (x) | D = vi t + ½ at2 | D = 4.2 m/s (2.5 s) + ½ -10m/s2 (2.5s)  (notice 2 motions)  Vi is positive up and requires us to recognize that gravity is negative when in opposite direction | (-20 meters) |
| 3 | 8.3 min  Distance??  V = 3.00 X 108 m/s | T = 8.3 min  V = 3.00 X 108 m/s  D = ? | V = d/t  Or  D = vt | Convert min to sec  8.3 min = 498 sec = 5.0 X 102 s  So  D = 5.0 X 102 s (3.00 X 108 m/s) | 1.5 X 10 11 m |
| 4 | C:\Program Files\Microsoft Office\MEDIA\CAGCAT10\j0212957.wmf55 km/hr Distance to stop in meters?  0.75 s stop | V= 55 km/h  Or V = 15.2 m/s  (see work)  T - .75 s  D = ? in meters | D = vt  Or  ***To convert***  ***km/hr = m/s***  ***divide # by 3.6*** | Convert km to m  55 km/hr X 1000 m = 55 000 m/hr  1 km  Then convert hours to sec  55 000 m/hr X 1 hr = 15.2 m/s  3600 s  Now d = 15.2 m/s ( 0.75 sec) | D = 11 m  Why?  Can only use 2 digits that are significant  (0.75 sec) |
| 5 a  b. | 125 m  80 m  125 m  80 m | 8 |  | 1. 80 + 125 = 2. 80 -125 = 3. Distance walked either way equals🡪 | 1. 205 m 2. -45 m 3. 205 m |
| 6 | 0.30 s  gun  100 m | D = 100 m  T = 0.30 s  V? | V = d/t | V = 100 m/.30 s | =330 m/s |
| 7 | 720.0 m/s  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 324 m\_ | D = 324 m  V = 720 m/s   1. T? 2. V in km/hr | 1. T= d/v   m/s X 3.6 = km/hr | 1. 324 m/720.0 m/s 2. 720 m/s X 3.6 = | 1. 0.450s 2. 2592 km/hr |
|  |  |  |  |  |  |